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EXAMINER

VU, QUANG D

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 10/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/829,505

Applicant(s)

TZU ET AL.

Examiner

Quang D Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 9-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election without traverse of group II, claims 9-12 in Paper No. 3 are acknowledged.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 9-11, 14,16-20, 22, 24 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,281,568 to Glenn et al.

Regarding claim 9, Glenn et al. teach a semiconductor package in figure 11. It comprises:

a leadframe (73) having a die pad (72) and bonding pads [31] (the portion of leadframe 73 where the bonding wire 77 will be bonded on it), wherein the die pad is designed to carry a die adhered thereon by adhesive material (87), wherein the die pad and bonding pads are separated;

a plurality of bonding wires (77) connected between the bonding pads and the die for electrical communication; and

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molding (81) compound encompassing the die, the bonding wires and a first surface of the leadframe, leaving the terminal of the bonding pads and the lower surface of the die pad exposed out of the molding compound for providing excellent thermal dissipation from the package, wherein the exposed bonding pads is used for communication terminal for the package (see figure 11).

Regarding claim 10, Glenn et al. teach the die is attached by adhesive material (see figure 11).

Regarding claim 11, Glenn et al. teach the adhesive material (87) includes epoxy (column 10, lines 58-59).

Regarding claim 14, Glenn et al. teach the molding compound includes mold resin (column 7, lines 19-23).

Regarding claim 16, Glenn et al. teach the leadframe (73) comprises two the bonding pads [31] (the portion of leadframe 73 where the bonding wire 77 will be bonded on it) (see figure 11).

Regarding claim 17, Glenn et al. teach the die pad (72) and the bonding pad [31] (the portion of leadframe 73 where the bonding wire 77 will be bonded on it) are formed of same conductive material (see figure 11).

Regarding claim 18, Glenn et al. teach a semiconductor package in figure 11. It comprises:

- a die (52);

- a die pad (72) for carrying the die attached thereon;

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a plurality of bonding pads [31] (the portion of leadframe 73 where the bonding wire 77 will be bonded on it) separated from the die pad.

a plurality of bonding wires (77) connected between the bonding pads and the die for electrical communication; and

a molding (81) compound encompassing the die, the bonding wires, a portion of each the bonding pad and a upper surface of the die pad, leaving the terminal of each the bonding pad and a lower surface of the die pad exposed out of the molding compound for providing excellent thermal dissipation from the package.

Regarding claim 19, Glenn et al. teach an adhesive material (87) adhering the die (52) and the die pad (72) (see figure 11).

Regarding claim 20, Glenn et al. teach the adhesive material (87) includes epoxy (column 10, lines 58-59).

Regarding claim 22, Glenn et al. teach the die pad (72) and the bonding pad [31] (the portion of leadframe 73 where the bonding wire 77 will be bonded on it) are formed of same conductive material (see figure 11).

Regarding claim 24, Glenn et al. teach the molding compound includes mold resin (column 7, lines 19-23).

Regarding claim 26, Glenn et al. teach a semiconductor package in figure 11. It comprises:

a die (52); a die pad (72) for carrying the die attached thereon; two bonding pads [31] (the portion of leadframe 73 where the bonding wire 77 will be bonded on it) separated from the die pad; two bonding wires (77) each of which connected between one of the bonding pads and the

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die for electrical communication; and a molding (81) compound encompassing the die, the bonding wires, a portion of each the bonding pad and a upper surface of the die pad, leaving the terminal of each the bonding pad and a lower surface of the die pad exposed out of the molding compound for providing excellent thermal dissipation from the package.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 12, 23 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,281,568 to Glenn et al. as applied to claims 9, 18 and 26 above, and further in view of US Patent No. 6,198,171 to Huang et al.

Regarding claims 12, 23 and 27, Glenn et al. do not teach the bonding wires include gold. However, Huang et al. teach the bonding wires (216) include gold (column 3, lines 56-57). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Huang et al. into the device taught by Glenn et al., since it is a well known material and desirable to improve the electrical connection.

5. Claims 13 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,281,568 to Glenn et al. as applied to claims 11 and 20 above, and further in view of US Patent No. 6,294,830 to Fjelstad.

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Regarding claim 13, Glenn et al. do not teach the adhesive material includes silver epoxy. However, Fjelstad teaches the adhesive material includes silver epoxy (column 4, lines 56-57). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Fjelstad into the device taught by Glenn et al., since it is desirable for the thermal path to dissipate heat from the chip.

Regarding claim 21, Glenn et al. do not teach the adhesive material includes silver epoxy. However, Fjelstad teaches the adhesive material includes silver epoxy (column 4, lines 56-57). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Fjelstad into the device taught by Glenn et al., since it is desirable for the thermal path to dissipate heat from the chip.

6. Claims 15, 25 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,281,568 to Glenn et al.

Regarding claim 15, Glenn et al. do not teach a solder ball formed on the terminal of the bonding pad in the embodiment of figure 11. However, Glenn et al. teach a solder ball (57) formed on the terminal of the leadframe in the embodiment of figure 6. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include claimed limitation shown in the embodiment of figure 6 into the embodiment of figure 11, since it is desirable for the electrical contact with other side of leadframe.

Regarding claim 25, Glenn et al. do not teach a solder ball formed on the terminal of the bonding pad in the embodiment of figure 11. However, Glenn et al. teach a solder ball (57) formed on the terminal of the leadframe in the embodiment of figure 6. Therefore, it would have

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been obvious to one having ordinary skill in the art at the time the invention was made to include claimed limitation shown in the embodiment of figure 6 into the embodiment of figure 11, since it is desirable for electrical contact with other side of leadframe.

Regarding claim 28, Glenn et al. do not teach a solder ball formed on the terminal of the bonding pad in the embodiment of figure 11. However, Glenn et al. teach a solder ball (57) formed on the terminal of the leadframe in the embodiment of figure 6. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include claimed limitation shown in the embodiment of figure 6 into the embodiment of figure 11, since it is desirable for electrical contact with other side of leadframe.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang D Vu whose telephone number is 703-305-3826. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



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QVU

September 23, 2002

  
Sara Crane  
Primary Examiner